



TECHNICAL GUIDE

AFFINITY

MODELS: PV9

GAS-FIRED CONDENSING / HIGH EFFICIENCY TWO STAGE VARIABLE UPFLOW FURNACES

UP TO 94% AFUE

NATURAL GAS 40 - 120 MBH INPUT



Due to continuous product improvement, specifications are subject to change without notice.

Visit us on the web at www.york.com for the most up-to-date technical information.

Additional rating information can be found at www.gamanet.org.

DESCRIPTION

These Category IV, highly efficient, compact, condensing type furnaces are designed for residential and commercial installations in a basement, closet, alcove, recreation room or garage where the ambient temperature is above 32°F, or higher. They may be either side wall or thru-roof vented using approved plastic type combustion air and vent piping. All units are factory assembled, wired and tested to assure dependable and economical installation and operation.

WARRANTY

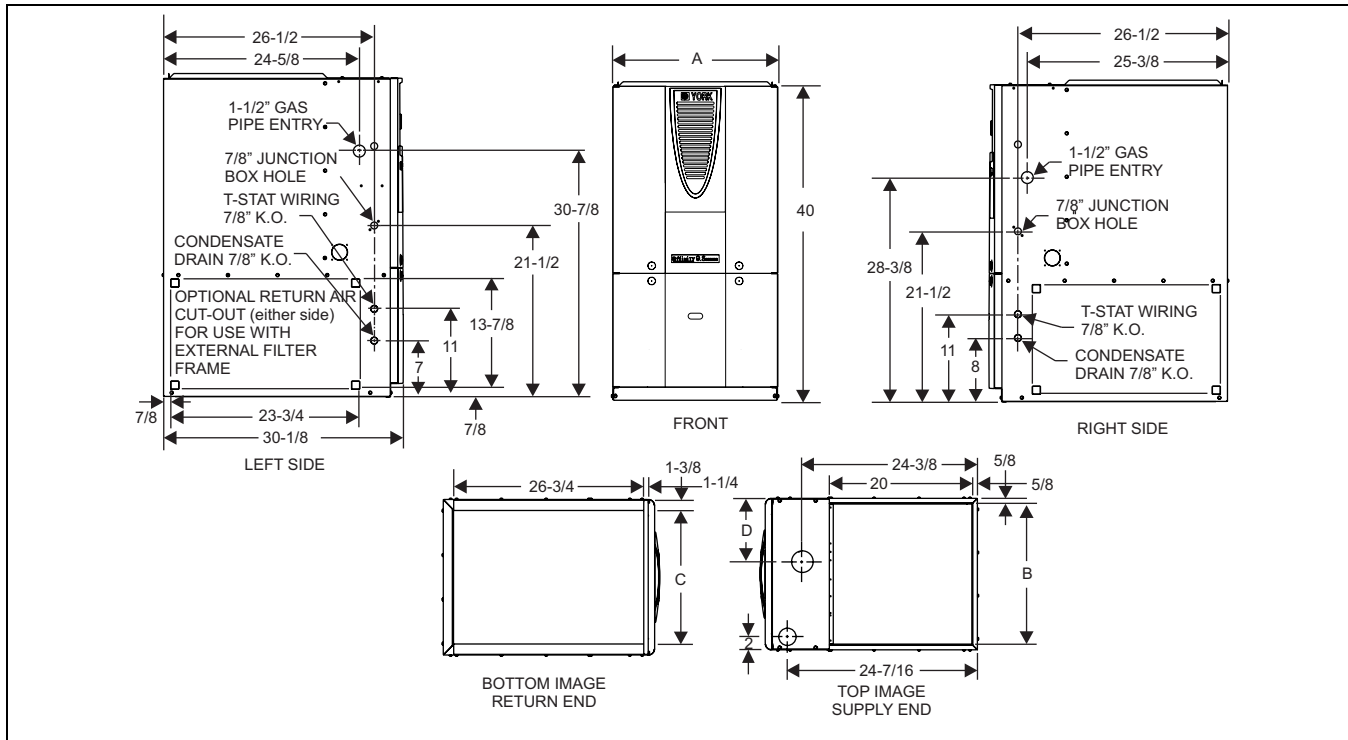
Lifetime limited warranty on both heat exchangers to the original purchaser; a 20-year limited warranty from original installation date to subsequent purchaser.

10-year warranty on the heat exchanger in commercial applications.

5-year limited parts warranty.

FEATURES

- Two stage heating operation includes:
 - Two stage gas valve
 - Two stage inducer operation
 - Variable speed ECM blower operation
- Provides increased comfort level & very quiet unit operation
- Adjustable delay timer allows two stage operation with single stage thermostat
- Compact, easy to install, ideal height 40" cabinet
- Blower-off delay for cooling SEER improvement.
- Easy to connect power/control wiring.
- Built-in, high level self diagnostics with fault code display.
- Low unit amp requirement for easy replacement application.
- Integrated control module for reliable, economical operation.
- High velocity filter and side -return filter rack provided for easy field installation.
- May be installed as either two-pipe (sealed combustion) or single pipe vent (using indoor combustion air)
- Top intake & vent connection allows installation in narrow locations.
- Electronic Hot Surface Ignition saves fuel cost with increased dependability and reliability.
- Induced combustion system with inshot main burners for quiet, efficient operation.
- No special vent termination kit required.
- 100% shut off main gas valve for extra safety.
- 24V, 40 VA control transformer and blower relay supplied for add-on cooling.
- Hi-tech tubular aluminized steel primary heat exchanger.
- Secondary (condensing) heat exchanger of 29-4C high-grade stainless steel.
- Timed on, adjustable off blower capability for maximum comfort.
- Solid removable bottom panel allows easy application.
- Easy access from front of unit for cleaning, maintenance or service.
- Protection from intake, exhaust or condensate blockage.
- Insulated blower compartment for quiet operation.
- ClimaTraK comfort system allows dealer to customize comfort settings based on regional location.



DIMENSIONS

Models	Nominal CFM	Cabinet Size	Cabinet Dimension			
			A (in.)	B (in.)	C (in.)	D (in.)
PV9A12N040UP11	1200	A	14-1/2	13-1/2	12-1/8	6-1/4
PV9B12N060UP11	1200	B	17-1/2	16-1/4	15-1/8	8-1/2
PV9B12N080UP11	1200	B	17-1/2	16-1/4	15-1/8	8-1/2
PV9C16N080UP11	1600	C	21	19-3/4	18-1/2	8-7/8
PV9C20N100UP11	2000	C	21	19-3/4	18-1/2	8-7/8
PV9D20N120UP11	2000	D	24-1/2	23-1/4	21-7/8	10-5/8

COMBUSTION AIR SUPPLY AND VENT PIPING

MAXIMUM ELBOWS AND VENT LENGTHS										
Models	Pipe Size Inches (cm)	Maximum Number of Elbows*								Minimum Length
		1	2	3	4	5	6	7	8	
40,000	1-1/2	30	25	20	10	N/A	N/A	N/A	N/A	5
40,000	2	70	65	60	55	50	45	35	25	5
60,000	1-1/2 (3.8)	30	25	20	10	N/A	N/A	N/A	N/A	5
60,000	2 (5.1)	60	55	50	45	40	30	20	10	5
60,000	3 (7.6)	85	80	75	70	65	60	50	40	20
80,000	1-1/2 (3.8)	20	15	N/A	N/A	N/A	N/A	N/A	N/A	5
80,000	2 (5.1)	60	55	50	45	40	30	20	10	5
80,000	3 (7.6)	85	80	75	70	65	60	50	40	20
100,000	2 (5.1)	25	20	15	N/A	N/A	N/A	N/A	N/A	5
100,000	3 (7.6)	85	80	75	70	65	60	50	40	20
120,000	3 (7.6)	75	70	65	60	55	45	35	25	5

Three elbows (two in vent pipe and one in the air intake pipe) are already accounted for and need not be included in the elbow count from the Table above.

NOTE: If installing furnace at altitudes between 2000 - 4500 ft. (609.6 - 1371.6m), intake and vent pipe length must be reduced by 10 ft. (3.05 m). If the installation requires the maximum allowable intake and vent pipe length, the furnace must be converted for high altitude operation. Refer to the proper high altitude application instruction for details.

ELECTRICAL AND PERFORMANCE DATA

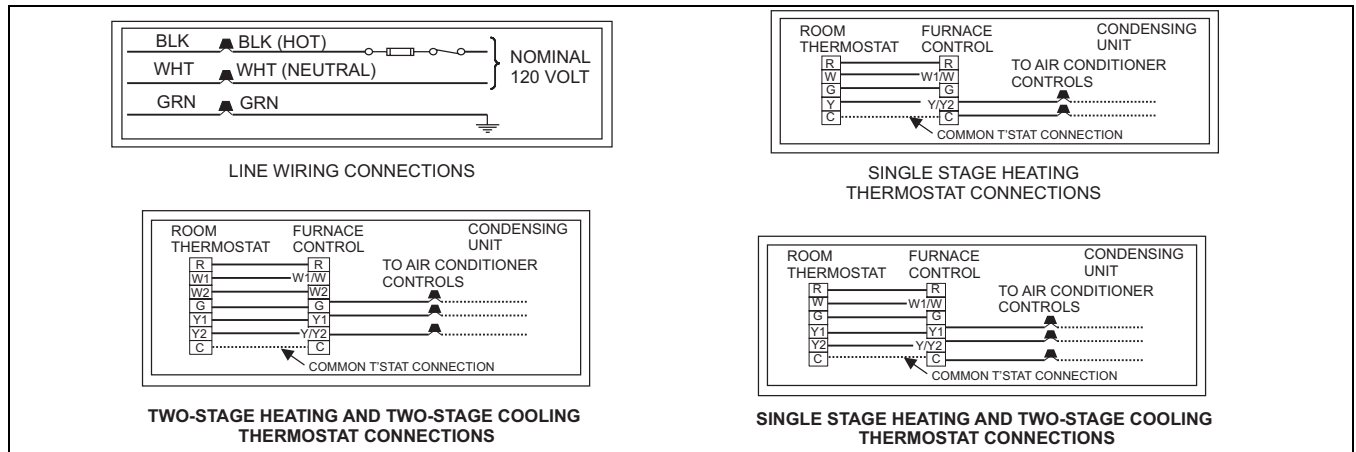
Models	Input High/Low	Output High/Low	Blower Size	Blower		Max. Over-current Protect	Air Temp. Rise
	MBH	MBH	In.	HP	Amps		°F
PV9A12N040UP11	40/26	38/24	11 x 8	1/2	7.7	20	35 - 65
PV9B12N060UP11	60/39	56/36	11 x 8	1/2	7.7	20	40 - 70
PV9B12N080UP11	80/52	75/49	11 x 8	1/2	7.7	20	45 - 75
PV9C16N080UP11	80/52	75/49	11 x 10	3/4	9.6	20	45 - 75
PV9C20N100UP11	100/65	93/60	11 x 11	1	12.8	20	45 - 75
PV9D20N120UP11	120/78	112/73	11 x 11	1	12.8	20	40 - 70

Models	Max. Outlet Air Temp.	Nominal Airflow	Cabinet Width	Total Unit	AFUE	Min. Wire Size (awg) @ 75 ft. One Way	Approximate Operating Weight
	°F	CFM	In.	Amps	%		
PV9A12N040UP11	165	1200	14-1/2	9	94.0	14	121
PV9B12N060UP11	170	1200	17-1/2	9	93.2	14	135
PV9B12N080UP11	175	1200	17-1/2	9	92.5	14	142
PV9C16N080UP11	175	1600	21	12	92.8	14	157
PV9C20N100UP11	175	2000	21	14	92.8	12	164
PV9D20N120UP11	170	2000	24-1/2	14	93.2	12	180

* ESP (External Static Pressure) .5" WC is at furnace outlet ahead of cooling coil.
 Annual Fuel Utilization Efficiency (AFUE) numbers are determined in accordance with DOE Test procedures.
 Wire size and over current protection must comply with the National Electrical Code (NFPA-70-latest edition) and all local codes.
 The furnace shall be installed so that the electrical components are protected from water.

NOTES:

1. For altitudes above 2000 ft. reduce capacity 4% for each 1000 ft. above sea level.
2. Wire size based on copper conductors, 60°C, 3% voltage drop.
3. Continuous return air temperature must not be below 55°F.
4. All filters must be high velocity cleanable type.
5. Air flows above 1800 CFM require either return from two sides or one side plus bottom.



AIR FLOW DATA

HIGH / LOW SPEED COOLING AND HEAT PUMP CFM						
40,000 INPUT - 3 Ton		60,000 INPUT - 3 Ton		JUMPER SETTINGS		
CFM		CFM		COOL Tap	ADJ Tap	
High	Low	High	Low			
1340	995	1330	900	A	B	
1205	885	1130	800	B	B	
1255	920	1220	850	A	A	
1150	835	1040	730	B	A	
1170	855	1120	770	A	C	
1025	755	920	650	C	B	
1045	780	950	660	B	C	
835	625	740	540	D	B	
950	705	860	610	C	A	
785	590	690	540	D	A	
865	665	790	570	C	C	
725	605	630	530	D	C	
80,000 INPUT - 3 Ton		80,000 INPUT - 4 Ton		JUMPER SETTINGS		
CFM		CFM		COOL Tap	ADJ Tap*	
High	Low	High	Low			
1310	890	1660	1110	A	B	
1100	740	1550	1050	B	B	
1220	830	1610	1070	A	A	
1000	670	1440	960	B	A	
1090	720	1470	990	A	C	
900	610	1370	920	C	B	
880	610	1290	850	B	C	
680	510	1130	790	D	B	
810	580	1230	850	C	A	
630	500	1050	720	D	A	
730	530	1110	760	C	C	
590	500	950	660	D	C	
100,000 INPUT - 5 Ton		120,000 INPUT - 5 Ton		JUMPER SETTINGS		
CFM		CFM		COOL Tap	ADJ Tap*	
High	Low	High	Low			
2210	1480	2280	1510	A	B	
1780	1180	1860	1190	B	B	
2040	1350	2090	1370	A	A	
1620	1050	1630	1060	B	A	
1840	1250	1880	1250	A	C	
1560	1010	1620	1030	C	B	
1470	940	1500	960	B	C	
1370	890	1410	880	D	B	
1460	930	1490	920	C	A	
1250	790	1290	790	D	A	
1310	810	1360	840	C	C	
1090	690	1140	690	D	C	
HIGH / LOW HEAT CFM						
40,000 INPUT - 3 Ton		60,000 INPUT - 3 Ton		JUMPER SETTINGS		
CFM		CFM		HEAT Tap	ADJ Tap*	
High	Low	High	Low			
1045	740	1110	710	A	Any	
905	645	960	640	B	Any	
825	595	870	600	C	Any	
765	590	830	570	D	Any	
80,000 INPUT - 3 Ton		80,000 INPUT - 4 Ton		JUMPER SETTINGS		
CFM		CFM		HEAT Tap	ADJ Tap*	
High	Low	High	Low			
1330	880	1490	990	A	Any	
1180	810	1350	900	B	Any	
1100	730	1220	820	C	Any	
1010	670	1120	770	D	Any	
100,000 INPUT - 5 Ton		120,000 INPUT - 5 Ton		JUMPER SETTINGS		
CFM		CFM		HEAT Tap	ADJ Tap*	
High	Low	High	Low			
1880	1230	2150	1420	A	Any	
1670	1080	1930	1290	B	Any	
1530	980	1850	1190	C	Any	
1430	900	1660	1070	D	Any	

All CFM's are shown at 0.5" w.c. external static pressure. These units have variable speed motors that automatically adjust to provide constant CFM from 0.0" to 0.6" w.c. static pressure. From 0.6" to 1.0" static pressure, CFM is reduced by 2% per 0.1" increase in static. Operation on duct systems with greater than 1.0" w.c. external static pressure is not recommended.
 NOTE: At some settings, LOW COOL and/or LOW HEAT airflow may be lower than what is required to operate an airflow switch on certain models of electronic air cleaners. Consult the instructions for the electronic air cleaner for further details.
 * The ADJ "D" tap should not be used.

FILTER PERFORMANCE

The airflow capacity data published in the “Blower Performance” table listed above represents blower performance WITHOUT filters. To determine the approximate blower performance of the system, apply the filter drop value for the filter being used or select an appropriate value from the “Filter Performance” table shown below.

NOTE: The filter pressure drop values in the “Filter Performance” table shown below are typical values for the type of filter listed and should only be used as a guideline. Actual pressure drop ratings for each filter type vary between filter manufacturer.

FILTER PERFORMANCE - PRESSURE DROP INCHES W.C. AND (KPA)

Airflow Range	Minimum Opening Size		Filter Type					
			Disposable		Washable Fiber*		Pleated	
	1 Opening Sq. in.	2 Openings Sq. in.	1 Opening In w.c.	2 Opening In w.c.	1 Opening In w.c.	2 Opening In w.c.	1 Opening In w.c.	2 Opening In w.c.
0 - 750	230		0.01		0.01		0.15	
751 - 1000	330		0.04		0.03		0.20	
1001 - 1250	330		0.08		0.07		0.20	
1251 - 1500	330		0.08		0.07		0.25	
1501 - 1750	380	658	0.14	0.08	0.13	0.06	0.30	0.17
1751 - 2000	380	658	0.17	0.09	0.15	0.07	0.30	0.17
2001 & Above	463	658	0.17	0.09	0.15	0.07	0.30	0.17

* Washable Fiber Filters are the type supplied with furnace.

APPLYING FILTER PRESSURE DROP TO DETERMINE SYSTEM AIRFLOW

To determine the approximate airflow of the unit with a filter in place, follow the steps below:

1. Select the filter type.
2. Select the number of return air openings or calculate the return opening size in square inches to determine the proper filter pressure drop.
3. Determine the External System Static Pressure (ESP) without the filter.
4. Select a filter pressure drop from the table based upon the number of return air openings or return air opening size and add to the ESP from Step 3 to determine the total system static.
5. If total system static matches a ESP value in the airflow table (i.e. 0.20, 0.60, etc,) the system airflow corresponds to the intersection of the ESP column and Model/ Blower Speed row.

ACCESSORIES

PROPANE (LP) CONVERSION KIT -

1NP0580 - All units

This accessory conversion kit may be used to convert natural gas (N) units for propane (LP) operation. Conversions must be made by qualified distributor or dealer personnel.

CONCENTRIC VENT TERMINATION -

1CT0302 (2")

1CT0303 (3")

For use through rooftop, sidewall. Allows combustion air to enter and exhaust to exit through single common hole.

CONDENSATE NEUTRALIZER KIT - 1NK0301

Neutralizer cartridge has a 1/2" plastic tube fittings for installation in the drain line. Calcium carbonate refill media is also available from the Source 1 Parts (p/n 026-30228-000).

SIDEWALL VENT TERMINATION - 1HT0901

For use on sidewall, two-pipe installations only. Provides a more attractive termination for locations where the terminal is visible on the side of the home.

EXTERNAL BOTTOM RETURN FILTER RACK W/FILTER -

Provides a cleanable, high velocity type filter and filter rack. Attaches to the bottom of the furnace.

1BR0314 - For 14-1/2" cabinets

1BR0317 - For 17-1/2" cabinets

1BR0321 - For 21" cabinets

1BR0324 - For 24-1/2" cabinets

HIGH ALTITUDE PRESSURE SWITCHES -

These accessory kits may be used to convert units for high altitude operation. Conversion must be made by qualified distributor or dealer personnel.

Pressure Switch Kits	Furnace Models 4,500 Ft to 10,000 Ft.
1PS0501	60 MBH
1PS0502	80/1200 MBH
1PS0503	80/1600, 120 MBH
1PS0504	100/1600 MBH
1PS0505	100/2000 MBH
1PS0506	40 MBH

NOTE: For high altitude conversion, an orifice change may also be required. See application instructions.

ROOM THERMOSTATS - A wide selection of compatible thermostats are available to provide optimum performance and features for any installation.

1 Heat Stage only, manual, mechanical thermostat. Add sub-base for 1H/1C.

1H/1C, manual change-over electronic non-programmable thermostat.

1H/1C, auto/manual changeover, electronic programmable, deluxe 7-day, thermostat.

1H/1C, auto/manual changeover, electronic programmable.

* For the most current accessory information, refer to the price book or consult factory.

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